**********FLIGHT INSTRUCTOR BULLETIN**********

BULLETIN NUMBER 4

TASK: How to avoid a Midair Collision

SUBTASKS: Scan Patterns
Collision avoidance at airports

OBJECTIVE: To develop awareness and procedures to aid in avoiding a midair collision.

STANDARDS: N/A

CONDITIONS : N/A

DESCRIPTION: 1. The Facts

In a six month period, one FDSO experienced 5 midair collisions and 6 near midair collisions. The FAA is determined to reduce this numbers. No pilot is invulnerable to an in-flight collision.

The most important guard against such mishaps is to know the limitations of the eye and how to scan effectively for other traffic.

2. What can you do?

We offer the following information and suggestions to the flight instructor when teaching a student:

NOTE: Most midair collisions occur:

* During daylight hours, in VFR conditions.

* Within 5 miles of an airport.

* Below 3000 feet AGL (almost 50% occur below 500 feet AGL).

* Between aircraft on overtaking or converging flight paths.

* In the traffic pattern, primarily on final approach.

3. How to avoid a midair collision:

A. Understand the function and limitations of the eye. *We suggest the flight instructor reference the Flight Training Handbook, Chapter 14, the Medical Handbook for Pilots, Chapter 11, and How to Avoid a Midair Collision, pamplet number P-8740-51.*

B. Develop and use an effective scanning technique.

NOTE: In normal flight, you can generally avoid the threat of an in-flight collision by scanning an area 60° to the left and to the right of your center visual area. This doesn't mean you should forget the rest of the area you can see from side windows every few scans. Horizontally, the statisticians say you will be safe if you scan 10° up and down from your flight vector. This will allow you to spot any aircraft that is at an altitude that might prove hazardous to your own flight path, whether it's level with you, below and climbing, or above and descending.

The slower your plane, the greater your vulnerability, hence the greater scan area required.

4. Scan Patterns.

A. Your best defense against an in-flight collision is an efficient scan pattern. *The most effective technique is called the "Block System". Within the "Block System" are two basic scans that have proven best for most pilots. The first is the "Side to Side Method" and the second is the "Front to Side Method".*

B. The "Block System" is based on the theory that traffic detection can be made only through a series of eye fixations at different points in space. Each of these fixes becomes the focal point of your field of vision (a block 10-15° wide).

C. By fixating every 10-15° wide, you should be able to detect any contrasting or moving object in each block. This gives you 9-12 blocks in your scan area, each requiring a minimum of one to two seconds for accommodation and detection.

D. One method of the "Block System" is the "Side to Side" scan. *Start at the far left of your visual area and make a methodical sweep to the right, pausing in each block to focus. At the end of the scan, return to the panel to verify instrument indication.*

E. The second form is the "Front to Side" version. *Start with a fixation in the center block of your visual field (approximately the center of the front windshield in front of the pilot). Move your eyes to the left, focusing in each block, swing quickly back to the center block, and repeat the performance to the right.*

5. The following are some additional tips for avoiding a mid air collision:

A. Make certain you compensate for blind spot in your aircraft. (example: wings, window post, etc.).

B. Ensure you have a clean windshield and side windows.

C. Use sunglasses, when appropriate.

D. Lower windshield visors to protect against the sun, when appropriate.

E. Raise the windshield visors when not needed.

F. Operate all collision avoidance lighting (beacon, strobes, landing light). This is especially important during operations in the traffic pattern and flight in reduced visibility.

G. Carefully monitor the communications radio when applicable, for other traffic.

H. Keep instructional conversion to a minimum.

I. Remain situationally aware of the location of other traffic on the frequency.

J. Be vigilant for potential traffic not on the frequency.

K. Cease instructional conversation during points of time when other pilots transmit on the frequency. *This is done in order for you to determine the other pilot's location and probable flight path.*

L. Maintain an organized cockpit to reduce time spent inside the cockpit.

M. Assure the area is clear before changing your flight path or performing maneuvers. *In a high wing airplane it is important to raise the wing and clear the area before beginning a turn.*

N. Always consider collision avoidance one of your highest priories.

O. Avoid flying directly over navigation aids. Other aircraft may be using the same navaid. In addition, use vigilance when operating near a navaid.

P. During climbs make shallow banks, if possible, so as to clear the area ahead of the nose of the aircraft.

6. The following are tips for avoiding a mid-air collision when operating at an airport with an operating control tower:

A. Departing aircraft should observe the following:

a. The pilot should clear the final approach path before taxi on to the active runway. *Always visually verify ATC clearance. ATC may have missed traffic on final.*

b. When the airport has parallel runways, the pilot must ensure the aircraft remains on the extended runway centerline of the takeoff runway. *If a crosswind exists, the aircraft may drift into the departure path of another aircraft operating on the parallel runway if corrective action is not taken.*

c. Remain on the tower frequency for at least 10 miles, if appropriate. *This will allow the pilot to monitor for other traffic in the area.*

B. Arriving aircraft observe the following:

a. Call the control tower approximately 10 miles out and carefully monitor other pilot's transmission in order to determine their position.

b. Remain situationally aware of the location of other traffic on the frequency.

c. Accurately report your position to the control tower when requested to do so.

e. Be especially vigilant when entering the traffic pattern. In addition, enter the traffic pattern at the appropriate traffic pattern altitude, unless otherwise instructed by the control tower.

f. When in the pattern, check for traffic before turning downwind, base, and, especially, final.

g. Make sure the final approach path and the landing runway are visually clear even though the control tower may have cleared you to landing.

h. Keep instructional conversation to a minimum. *Stop talking when the control tower transmits.*

7. The following are tips for avoiding a mid-air collision when operating at an airport without an operating control tower:

A. Departing aircraft should observe the following:

a. Monitor the appropriate common traffic advisory frequency (CTAF). *Do this well in advance of the takeoff to determine the location of other traffic, if any.*

b. Prior to takeoff, pivot the aircraft 360°, if possible. *This will ensure that the pilot has viewed the entire airport area. Be vigilant for aircraft using intersecting runways.*

c. Announce on the CTAF the aircraft type and identification number, airport name, runway number, and your intended direction of flight.

d. Remain on the CTAF frequency for at least 10 miles, if appropriate. *This will allow the pilot to monitor for other traffic in the area.*

B. Arriving aircraft observe the following:

a. Obtain an airport advisory from Unicom, Flight Service, or other aircraft operating in the traffic pattern.

b. If overflying the airport to determine the landing direction, do so at least 500 feet above traffic pattern altitude. *This will allow you to remain well above other aircraft operating in the pattern.*

c. Be especially vigilant when entering the traffic pattern. In addition, enter the traffic pattern at the appropriate traffic pattern altitude. *Do not descend into the traffic pattern.*

d. If appropriate, announce your position when you are on downwind, base, and, especially, final. *Announce your aircraft type, indentification number, airport name and runway number and your position.*

e. Maintain vigilance for aircraft not using the CTAF frequency. *Not all aircraft are equipped with a communication radio.*

f. Fly a normal traffic pattern. *Do not make a straight-in approach or a long final approach leg. Be vigilant for an aircraft that may be making a straight-in approach.*

CAUTION: Although a straight-in approach may reduce the flight time and expedite the arrival process, it is very difficult to detect an aircraft making a straight-in approach to an airport not having a control tower. It is for this reason that a straight-in approach or a long final approach is not recommended.

g. If conducting straight-in instrument approaches, make several announcements of your position and intentions during the procedure. *Make this announcement over the CTAF frequency once every mile beginning at approximately 5 miles from the airport. This will alert traffic operating at the airport that a straight-in approach is in progress.*

h. When on final approach, be vigilant for aircraft on short final, aircraft on the runway, or an aircraft that may be departing in the opposite direction of the active runway. In addition, care must be used in monitoring intersecting runways being used by other traffic.